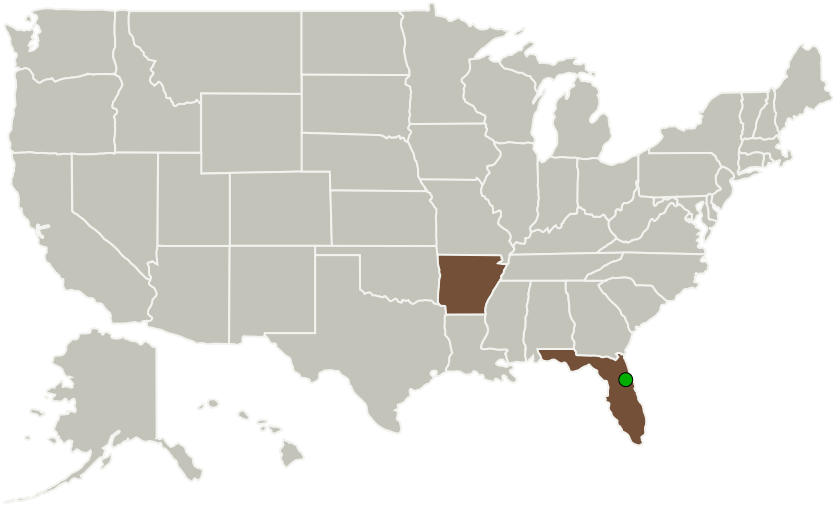
Transparent and Flexible Electrodynamic Coating for Particulate Removal, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

NASA has an unmet need for clean, dust-free surfaces critical for many mission applications: solar panels and collectors, aircraft components, optical windows, photographic equipment, and flight suits. However, dust mitigation and removal remains a difficult task, particularly given the nature and morphology of space-born particulate materials and the strong bonds they can develop with any surface. Several mechanical techniques involving shaking and wiping have been devised to address this problem, but these are difficult to implement and expensive to maintain over mission life cycles. One successful innovation that has been developed and tested for dust removal is the "electrodynamic shield" or EDS. The EDS is composed of inter-digitated, electrically conductive electrodes connected to an AC power supply. The main parameters that govern the efficiency of dust removal are the voltage and the frequency of the AC signal applied to the electrodes. Poly Adaptive, LLC, proposes to investigate the novel application and use of nanoscale materials to address severe limitations of existing EDS designs caused by the metallic electrodes that reduce the amount of radiation reaching solar panels. Successful Phase I results will show the feasibility of an EDS that is transparent and can be placed on top of any surface.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Poly Adaptive, LLC	Lead Organization	Industry	Little Rock, Arkansas
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations	
Arkansas	Florida

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139532)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Poly Adaptive, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

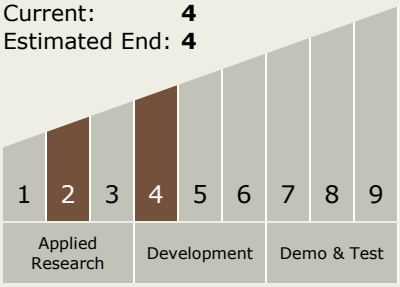
Carlos Torrez

Principal Investigator:

Charles R Buhler

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.5 Particulate Contamination Prevention and Mitigation

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System